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EXAMINER
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RAZA, SAIRA B

ART UNIT	PAPER NUMBER
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1711

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Application Number: 10/790,502  
Filing Date: March 01, 2004  
Appellant(s): SHAH ET AL.

**MAILED**

**MAY 3 1 2006**

**GROUP 1700**

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Steven R. Hansen  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed March 13, 2006 appealing from the Office action mailed October 14, 2005.

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**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

Claims 25-38 are currently pending in the present application, and stand Non-Finally rejected.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

**WITHDRAWN REJECTIONS**

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The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner. The rejection of claims 36-38 under 35 U.S.C. 112, second paragraph has been withdrawn.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

4,197,178	Pellegrini et al.	4-1980
4,025,578	Siebert	5-1977
6,274,262	Canfield	8-2001

Kirk-Othmer Encyclopedia of Chemical Technology, 4th ed., Vol. 20, John Wiley & Sons, New York: 1996, pp. 844-847, 853-855.

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 25-38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The term "generally ambient temperature" has been recited in the claims to somehow limit the temperature of the process. Although the specification supports "ambient temperature," it does not appear to support any temperatures outside the range of ambient temperature.

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Claims 25-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which appellant regards as the invention.

The independent claims recite “generally ambient temperatures” as a process step in the process and product claims. However, the word “generally” renders the claims indefinite because it is unclear as to the limitation of the temperature range. Since “generally” is typically used to mean “usually” or “commonly,” it is unclear how this word is meant to describe the temperature.

Claims 29-31 and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pellegrini et al. in view of Siebert.

Pellegrini teaches an improved bipolar separator for electrochemical cells, where the cells may be used in fuel cells (abstract; col. 1 lines 7-11). The separators are substantially impermeable to diffusion of hydrogen, are rigid and are protected from discharge of anionic species (col. 2 lines 33-38). The separator plates are made by molding carbon, graphite, or metallic powder into a thermosetting resin (col. 2 lines 60-68). Insulating coatings for the separators include polyester, phenolic, furanic, and epoxide resins (col. 4 lines 44-53). Pellegrini discloses that the separator is coated with a resin that is about 30 to 500  $\mu\text{m}$  thick (col. 4 lines 2-5).

Pellegrini applies as above, failing to mention the use of infrared-curable sealant materials comprising epoxy resin and acrylonitrile butadiene copolymer. Siebert teaches the use of compositions comprising epoxy resin, polybutadiene-acrylonitrile rubber, and an amine crosslinking agent (example 1), where the mixture is cast onto a substrate and thermally cured (col. 7 lines 33-50). The compositions can be used as castable gaskets, seals,

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and o-rings (col. 7 lines 51-57). It is the examiner's position that it would have been prima facie obvious to use the epoxy coatings of Siebert's invention as gaskets in Pellegri's invention, since the epoxy compositions of Siebert's invention are castable and hence more easily applied. Pellegri discloses that epoxy base resins with amine hardeners are exceptionally suitable in the invention (col. 4 lines 44-50); hence provides motivation to use the epoxy nitrile resin of Siebert. Therefore it would have been obvious to one of ordinary skill in the art to expect, with a high degree of probability, that a trial of the substitution of the epoxy nitrile base resin of Siebert for the resin in the invention of Pellegri would have been successful. Only a reasonable expectation of success, not absolute predictability is necessary for obviousness. *In re Longi*, 759F.2d 887, 897, 225 USPQ 645, 651-52 (Fed. Cir. 1985). *In re Pantzer*, 341 F2d. 121, 126; 144 USPQ 415, 419 (CCPA 1965).

Regarding the limitations to "polymerized or cross-linked in response to infrared radiation," it is the examiner's position that the cured coatings of the reference would be indistinguishable from those cured by infrared radiation. It is the examiner's position that the claimed cure process in this case would not provide a patentably distinct product.

Regarding the limitation of polymerization at "generally ambient temperatures," it is the examiner's position that the cure temperature would not provide a patentably distinct and structurally different product.

Claims 25, 27-28, 32, and 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pellegri et al. in view of Siebert as applied above, and further in view of *Kirk-Othmer Encyclopedia of Chemical Technology*.

The Pellegrini and Siebert references apply as above, teaching thermal crosslinking methods but failing to teach the use of infrared radiation to cure the coatings. The *Kirk-Othmer Encyclopedia of Chemical Technology* teaches that thermally cured polymer systems, including epoxy/polyfunctional amine systems, form thermal energy and cure by infrared radiation with improved efficiency and focus (p. 846; p. 854). Thus, it would have been prima facie obvious to use infrared radiation to thermally cure the coatings of the Pellegrini and Siebert inventions to improve efficiency and focus of the cure process.

In reference to claims 27 and 28, the time parameter regarding exposure of the resin to infrared radiation is recognized as a result effective variable. It would have been obvious to one of ordinary skill in the art at the time the invention was made to expose the resin to infrared radiation for less than about thirty minutes, since it has been held that discovering an optimum value as a result effective variable involves only routine skill in the art. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 26 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pellegrini et al. in view of Siebert and *Kirk-Othmer Encyclopedia of Chemical Technology* as applied above, and further in view of Canfield.

The references apply as above for the process of sealing a fuel cell plate, failing to mention the application of the coating by screen printing. However, Canfield shows the conventionality of screen printing a gasket onto a fuel cell plate (Figure 6, col. 4 lines 40-51). It is the examiner's position that it would have been prima facie obvious to use a screen printing technique to apply the gasket layer to provide a patterned discontinuous gasket layer having equally improved insulative properties.

**(10) Response to Argument**

35 U.S.C. 112, ¶ 1

In response to appellant's argument that the specification conveys "generally ambient," it is noted that the specification does not contain this term, nor does it provide support or guidance as to the numerical boundary of "generally" ambient temperature. The facts in the case law cited by appellant, *Anchor Wall Systems, Inc., v. Rockwood Retaining Walls, Inc.*, 340 F.3d 1298,1310 (Fed. Cir. 2003), are not "sufficiently similar" to appellant's application. In the cited case law, the term "generally" was disclosed in the specification. Conversely, appellant's specification does not disclose the term "generally" or the phrase "generally ambient temperature."

Appellant's specification does not specify any special definition for the term "generally" or the phrase "generally ambient temperature".

35 U.S.C. 112, ¶ 2

In response to appellant's argument that the phrase "generally ambient temperature" delimits the scope of the claims, it is noted that the term "generally" as used in the phrase above, can encompass an unlimited range, for example the phrase can encompass  $\pm 10^\circ$  from ambient temperature, resulting in indefiniteness.

35 U.S.C. 103(a)

Claim 29:

In response to the appellant's arguments that the examiner has not shown that the coatings of the reference would have the same structure and properties as those cured by infrared radiation, it is noted the appellant's disclose the use of both infrared and thermal curing as suitably equivalent



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processes for forming the inventive coating (specification: [0011, 0020]). Hence, one would reasonably expect an equivalent product to result.

Additionally, no evidence is provided to expect that utilizing one curing method over another would provide a patentable distinction. Thus no reason exists to expect unexpected results based on curing means. Regardless of cure process, the resulting product would be the same.

Appellants point to the specification to show that substrates warp with heat, it is noted that no evidence has been shown to support such an allegation. Also, the specification only notes that warpage problems *may* occur in *graphite* plates when heated to *certain temperatures* (specification: [0022]).

It is noted that the crosslinking materials used in the reference to form the coatings are the same as those used by the appellant (specification: [0012]); additionally supporting that one would reasonably expect an equivalent product to result.

Regarding the temperature limitations, it is noted that the product claims are written in product-by-process format. Since the same materials are crosslinked, it is the examiner's position that the article would have no structural differences than those made by the appellant's process.

In response to appellant's argument that Siebert and Pelligri do not suggest a fuel cell plate with an epoxy nitrile coating adhering to a surface of the plate. It is noted that Pelligri discloses a fuel cell plate with an epoxide resin insulating coating, and Siebert discloses the claimed epoxy nitrile resin. The position is taken that it would have been obvious to substitute the epoxy nitrile resin of Siebert for the epoxy resin in the invention of Pelligri. Therefore, the resulting coating would have been expected to perform an insulating function analogous to the insulating coating in the invention of Pelligri and, as disclosed by Pelligri, to be adhered to the surface of the fuel cell.

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Regarding appellant's argument that there is no motivation or suggestion in the prior art for combining Pellegrini and Siebert, it is noted that both references disclose applying resins into molds and curing. Pellegrini expressly discloses that the epoxide resin insulating coating is applied over the mold and then cured (col. 4 lines 2-12). As recognized by appellant, Siebert is also concerned with moldable products. Pellegrini discloses that epoxy base resins with amine hardeners are exceptionally suitable in the invention (col. 4 lines 44-50); hence provides motivation to use the epoxy nitrile resin of Siebert. Therefore it would have been obvious to one of ordinary skill in the art to expect, with a high degree of probability, that a trial of the substitution of the epoxy nitrile base resin of Siebert for the resin in the invention of Pellegrini would have been successful.

#### Claims 30 and 31

Attention is directed towards the rejection set forth above.

#### Claim 36

Attention is directed towards the response provided under Claim 29 regarding the argument of curing with infrared radiation.

In reference to the response regarding the terminology "consisting essentially of," it is noted that appellant's specification suggests the use of amine crosslinkers and various other reactive or non-reactive additives [0059; 0061]. Hence there is no reason for one to expect that the aforementioned terminology would exclude crosslinking amines. There is no evidence from the specification that amine compounds or other additives would materially affect the basic and novel characteristics of the invention.

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Claims 37 and 38

Attention is directed towards the response provided under claims 30 and 31.

Claim 25

Attention is directed towards the response provided under claim 29.

Regarding the process claims, the *Kirk-Othmer Encyclopedia of Chemical Technology* has been provided to teach the conventionality of using infrared radiation to cure thermally curable systems without conventional heating.

Kirk-Othmer discloses that infrared radiation has gained worldwide acceptance as an efficient and economical method for modifying polymeric materials (853). Furthermore, shortwave infrared radiation can be focused for improved efficiency (854). As stated in the rejection, Kirk-Othmer teaches that thermally cured polymer systems, including epoxy/polyfunctional amine systems, can be cured or processed efficiently using infrared radiation (854). Hence the advantages of infrared radiation curing are well known in the art, and it would have been obvious to one of ordinary skill in the art to cure the epoxy nitrile resin of Siebert as applied in the invention of Pellegrini using infrared radiation.

Claims 27 and 28

Attention is directed towards the rejection set forth above.

Claim 32

Attention is directed towards the response provided under claim 36.

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Claims 26 and 33

In response to appellant's argument that motivation or suggestion is lacking for combining Siebert and Canfield, it is noted that Canfield shows the conventionality of screen printing a gasket onto a fuel cell plate. Canfield expressly discloses that the gasket groove defines the "up side" of the flow plate (col. 4 lines 26-32), hence it would have been obvious to one of ordinary skill in the art at the time of the invention to ensure that a gasket groove is present to define the "up side" of the plate, one would do this by employing the Canfield's method of screen printing to form the gasket layer, i.e. resin coating layer as taught.

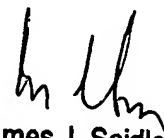
**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

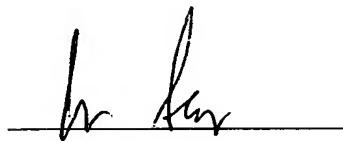
For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Saira Raza

  
James J. Seidleck  
Supervisory Patent Examiner  
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Conferees:



James Seidleck



David Wu